

WHAT IS CLAIMED IS:

1. A method for controlling an aircraft engine including a combustor, a fuel manifold, and a plurality of fuel injectors, the fuel manifold in flow communication with the fuel injectors for supplying fuel to the combustor, the combustor defining a combustion chamber, said method comprising:

supplying fuel to the combustor fuel injectors through a fuel pulsator and the fuel manifold, wherein the fuel pulsator is coupled to a controller that is upstream from the fuel pulsator; and

variably operating the controller to pulse fuel with the fuel pulsator to facilitate promoting stable combustion within the combustion chamber.

2. A method in accordance with Claim 1 wherein the pulsator is coupled between the controller and the fuel manifold, variably operating the controller further comprises pulsing fuel at a frequency and amplitude that facilitates natural acoustic avoidance within the combustion chamber.

3. A method in accordance with Claim 1 wherein the pulsator is coupled between the controller and the fuel manifold, variably operating the controller further comprises pulsing fuel at a frequency and amplitude that facilitates avoidance of natural mechanical vibrational modes inherent within the combustion chamber.

4. A method in accordance with Claim 1 wherein supplying fuel to the combustor fuel injectors further comprises supplying fuel to the combustor fuel injectors using a fuel pump coupled upstream from the fuel pulsator.

5. A method in accordance with Claim 1 wherein supplying fuel to the combustor fuel injectors further comprises supplying fuel to the fuel injectors through a fuel pulsator and the fuel manifold, wherein the fuel pulsator is coupled to a fuel inlet of the fuel manifold.

6. A combustion control system for controlling a turbine engine including a fuel manifold and a plurality of fuel injectors, said control system comprising:

a fuel pulsator in flow communication with said plurality of injectors, and said fuel manifold; and

a controller coupled to said fuel pulsator such that said pulsator between said controller and the fuel manifold, said controller variably selectable and configured to facilitate promoting stable combustion.

7. A combustion control system in accordance with Claim 6 wherein the fuel injectors supply fuel to a combustion chamber, said controller further configured to pulse fuel at a frequency and amplitude that facilitates resonance avoidance within the combustion chamber.

8. A combustion control system in accordance with Claim 6 wherein the fuel injectors supply fuel to a multi-stage combustor, said fuel pulsator applied to at least one stage of the combustor.

9. A combustion control system in accordance with Claim 6 further comprising a fuel pump coupled in flow communication to said fuel pulsator such that said fuel pump upstream from said pulsator.

10. A combustion control system in accordance with Claim 9 wherein the manifold includes an inlet fuel line, said pulsator coupled in flow communication to the inlet fuel line.

11. A combustion control system in accordance with Claim 6 wherein said pulsator variably operable during engine operations.

12. A combustion control system in accordance with Claim 6 wherein said controller further configured to pulse fuel at a frequency and amplitude that facilitates avoidance of natural mechanical vibrational modes inherent within the engine.

13. A gas turbine engine comprising:

a combustor defining combustion chamber;

a fuel manifold;

a plurality of fuel injectors in flow communication with said fuel manifold, said fuel injectors configured to supply fuel to said combustion chamber; and

a fuel control system coupled to said fuel manifold and said fuel injectors, said fuel control system comprising a fuel pulsator and a controller, said fuel pulsator in flow communication with said fuel manifold, said controller coupled to said fuel pulsator such that said pulsator between said controller and said fuel manifold.

14. A gas turbine engine in accordance with Claim 13 wherein said fuel control system controller variably selectable to facilitate promoting stable combustion within said combustion chamber.

15. A gas turbine engine in accordance with Claim 13 wherein said fuel control system pulsator selectively operable during engine operations.

16. A gas turbine engine in accordance with Claim 13 wherein said fuel control system further comprises a fuel pump upstream from said fuel pulsator.

17. A gas turbine engine in accordance with Claim 13 wherein said combustor is a multi-stage combustor, said fuel control system pulsator applied to at least one stage of the combustor and configured to pulse fuel at a frequency and amplitude that facilitates resonance avoidance within the combustion chamber.

18. A gas turbine engine in accordance with Claim 13 wherein said fuel manifold comprises an inlet fuel line, said fuel control system pulsator coupled in flow communication to said manifold inlet fuel line.

19. A gas turbine engine in accordance with Claim 6 wherein said fuel control system pulsator configured to pulse fuel at a frequency and amplitude that facilitates avoidance of natural acoustic and mechanical vibrational modes inherent within said combustion chamber.